

### Abstract of the Disclosure

A power supply system and a method to provide a smooth transition between utility power, transitory power and backup power in the event of a utility power failure to supply quality power to a load. As the utility power weakens due to a failure of the normal utility power supply, a synchronous machine becomes immediately a generator and supplies the required power to the load. In order to maintain the speed of the synchronous machine, kinetic energy needs to be transferred from a high speed flywheel using an "electrically controlled coupling" until the utility power recovers from its failure. Since the energy, which is stored in the flywheel, is limited, a standby engine will start and will continue to provide electrical power to the load either by turning a generator or by turning the flywheel.